

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS**

PRESIDENT AND FELLOWS OF)
HARVARD COLLEGE)

Plaintiff,)

v.)

MICRON TECHNOLOGY, INC.)

Defendant.)

Civil Action No. 1:16-cv-11249

JURY TRIAL DEMANDED

**PLAINTIFF'S OPPOSITION TO DEFENDANT MICRON TECHNOLOGY, INC.'S
MOTION TO DISMISS THE COMPLAINT**

I. Introduction

Harvard's Complaint for patent infringement contains sufficient factual matter "to 'state a claim to relief that is plausible on its face.'" *Ashcroft v. Iqbal*, 556 U.S. 662, 678 (2009) (citing *Bell Atlantic Corp. v. Twombly*, 550 U.S. 544, 570 (2007)). Where, as here, a patent owner does not have access to critical facts underlying their allegations because those facts are held in secret, pleading through circumstantial evidence demonstrating a likelihood of infringement is generally sufficient. *See, e.g., K-Tech Telecomm, Inc. v. Time Warner Cable*, 714 F. 3d 1277 (Fed. Cir. 2013) (analyzing allegations under formerly applicable Form 18 pleadings standards and *Iqbal/Twombly* standard requiring claims to be plausible on their face). As set forth in further detail below, the Harvard Complaint contains multiple factual allegations and citations that, when taken together, are sufficient to support the inference that Micron, in fact, utilizes the chemistries covered by the asserted patents during the manufacture of the accused products.

Boiled to its essence, Micron's critique of the allegations in Harvard's Complaint is that Harvard failed to plead sufficient facts to support the inference that Micron directly infringes one claim element that is similar across the exemplary asserted claims of the patents-in suit: *i.e.*, that Micron's manufacturing process for its dynamic random access memory ("DRAM") chips involves the use of a certain chemical precursor (or class of chemical precursors). (Def.'s Mem. in Supp. of Mot. to Dismiss at p. 6 (Dkt. #20) ("Motion")). Micron lodges three specific reasons for this critique: that Harvard only alleges what is "common" or "popular" (Motion at 6), that Harvard does not rely on "Micron references or documents to show what chemistry Micron actually uses" (Motion at 6-7), and that Harvard does not allege that the chemistry claimed in the patents is the *only* one that can be used to form the metal oxide films that are present in the accused Micron products (Motion at 7-8). Micron's proffered reasons are either illusory or irrelevant.

Notably absent in Micron's Motion is any discussion concerning the secrecy of Micron's manufacturing processes. The details of the exact process Micron uses to manufacture the accused DRAM chips are a tightly held secret. Micron does not allege, because it cannot, that there *are* publicly available "references or documents" that show "what chemistry Micron actually uses," or that Harvard somehow ignored those documents or references.

Instead, Harvard's allegations include evidence of its testing of Micron's completed DRAM chips, showing the location and composition of the thin metal oxide layer that results from Micron's manufacturing process. Nowhere does Micron suggest that additional testing would reveal the chemistry of the precursor used to produce the thin metal oxide layer that is present in Micron's completed DRAM chips. Absent such direct proof, the testing Harvard actually conducted is sufficient to support the inference that Micron is using the chemistries covered by Harvard's patents.

More specifically, Harvard's allegations are based, in the first instance, on its own efforts to examine the accused Micron DRAM products, from which it identified (as Harvard alleges) that the accused products include a zirconium oxide metal oxide layer. (*See, e.g.*, Compl. at ¶¶ 31, 52, 55, 58). Based on what is publicly known of Micron's manufacturing process, Harvard then alleges that Micron uses a certain process to create these thin films, called "atomic layer deposition," or "ALD." (*See, e.g.*, Compl. at ¶¶ 34, 45). Harvard also alleges facts that it knows about the use of ALD for the manufacture of the thin films in small-sized semiconductor products with the physical characteristics of DRAM chips such as the accused products, *i.e.*, that the process requires the use of specialized chemical precursors. (*See* Compl. at ¶¶ 12, 13). Harvard then alleges that, based on publicly available research and information, the most commonly used chemical precursor in ALD processes that result in the kind of metal oxide layer

that Harvard identified as being present in the accused products fall within the class of chemistries claimed by the patents at issue. (Compl. at ¶¶ 35, 53, 56, 60, 62). Accordingly, on information and belief, Harvard alleges that Micron uses the required precursor in the manufacture of the accused DRAM products. (Compl. at ¶¶ 35, 53, 56, 60, 62).

As set forth in further detail below, these allegations more than adequately meet the *Twombly* requirement at the pleadings stage that plausible grounds be pleaded in order to infer that Micron is liable for infringement. Even in the post-Form 18 world, the *Iqbal/Twombly* plausibility standard does not require absolute certainty, as Micron seems to suggest. Indeed, where a patent owner does not have access to critical facts underlying their allegations because those facts are held in secret, pleading through circumstantial evidence demonstrating a likelihood of infringement is generally sufficient. *See, e.g., K-Tech*, 714 F. 3d at 1285-87 (analyzing allegations under Form 18 as interpreted by *Iqbal/Twombly* facial plausibility standard). Such is the case here.

II. LEGAL STANDARD

“To survive a motion to dismiss, a complaint must contain sufficient factual matter, accepted as true, to ‘state a claim to relief that is plausible on its face.’” *Ashcroft v. Iqbal*, 556 U.S. 662, 678 (2009) (citing *Bell Atlantic Corp. v. Twombly*, 550 U.S. 544, 570 (2007)). “A claim has facial plausibility when the plaintiff pleads factual content that allows the court to draw the reasonable inference that the defendant is liable for the misconduct alleged.” *Id.* “The plausibility standard is not akin to a ‘probability requirement,’ but asks for more than a sheer possibility that a defendant has acted unlawfully.” *Id.*

A court generally accepts well-pleaded facts as true, and construes the complaint in the light most favorable to the plaintiff. *Langadinos v. American Airlines, Inc.*, 199 F. 3d 68, 69 (1st Cir. 2000). In ruling on a 12(b)(6) motion, a court limits its review to the complaint, documents

annexed to it or incorporated within it, documents referred to in the complaint but not annexed to it and matters that are susceptible to judicial notice. *Rodi v. S. New Eng. Sch. of Law*, 389 F.3d 5, 12 (1st Cir. Mass. 2004); *Blake v. Prof'l Coin Grading Serv.*, 898 F. Supp. 2d 365, 377 (D. Mass. 2012). The court may not consider, however, affidavits and miscellaneous documents proffered by the parties. *Id.*

Pleadings based on information and belief are permitted under the *Iqbal/Twombly* plausibility standard, where facts are peculiarly within the possession and control of the defendant, or where the belief is based on factual information that makes the inference of culpability plausible. *See Arista Records LLC v. Does*, 604 F. 3d 110, 120 (2d Cir. 2010); *see also Bruno Int'l Ltd. v. Vicor Corp.*, 2015 U.S. Dist. LEXIS 123556, *9-10 (D.Mass. Sept. 16, 2015). A plaintiff can plead facts based on information and belief as long as there is a good faith basis for doing so. *Langadinos*, 199 F. 3d at 73; *see also Rosenthal v. E. MPC Computers, LLC*, 493 F. Supp. 2d 182, 189-190 (D. Mass. 2007). And, as the Federal Circuit has noted, “[a] defendant cannot shield itself from a complaint for direct infringement by operating in such secrecy that the filing of a complaint itself is impossible.” *K-Tech*, 714 F. 3d at 1285-87.

III. ARGUMENT

A. Harvard’s Detailed, Factual Pleadings Rely On Far More Than What Is “Popular” Or “Common.”

Harvard’s Complaint alleges that Micron’s DRAM chips infringe U.S. Patent Nos. 6,969,539 (the “’539 Patent”) and 8,334,016 (the “’016 Patent”). (Compl. at ¶¶ 21-62). In support of its allegations, Harvard identifies exemplary claims of each patent and demonstrates how Micron’s DRAM chips practice each element of each exemplary claim. (Compl. at ¶¶ 21-62). Micron has challenged the sufficiency of Harvard’s allegations to only one element of the exemplary claims of each patent: the use of a chemical precursor, within a certain class of

required chemistries. (*See, generally*, Motion). For example, exemplary Claim 24 of the '539 Patent reads:

A process for forming a metal oxide, comprising:

exposing a heated surface alternately to the vapor of one or more metal amides having an amido group selected from the group consisting of dialkylamido, disilylamido and (alkyl) (sily) amido moieties, and then to the vapors of water or an alcohol.

See '539 Patent, Claim 24 (emphasis representing the element that Micron argues Harvard has failed to plead with sufficiency). Exemplary Claims 1, 2, 7 and 8 of the '016 Patent each have a similar element, which Micron also argues Harvard has failed to plead with sufficiency. *See* '016 Patent, Claim 1 (including the element "wherein said first reactant component comprises a metal alkylamide"); Claim 2 (depending from Claim 1); Claim 7 (depending from Claim 2, and including the element "wherein the metal alkylamide is a zirconium dialkylamide"); Claim 8 (depending from Claim 7, and including the element "wherein the zirconium dialkylamide is tetrakis (ethylmethyldamido) zirconium"). Harvard alleges upon information and belief that Micron meets these elements of the asserted claims by manufacturing its DRAM chips using an ALD process that uses the required chemical precursor, i.e., one that falls within the class of chemistries within the scope of the asserted claims. (*See* Compl. at ¶¶ 32-36, 46-54).

Harvard's pleadings, based in part upon its information and belief, more than adequately meet the pleading requirements of the Federal Rules of Civil Procedure. First, Harvard's belief that Micron uses the required precursor is based on factual information that makes the inference of culpability plausible. Second, facts regarding the specific precursor used by Micron are within Micron's exclusive possession and control. *See Arista Records*, 604 F.3d at 120. Micron cannot shield itself from Harvard's allegations merely because it maintains the details of its manufacturing process as a secret. *K-Tech*, 714 F. 3d at 1285-87.

In the absence of any available “Micron references or documents,” Harvard relies upon its own review of the accused product, publically available information about Micron’s use of ALD, Harvard’s knowledge about ALD as used in the manufacture of semiconductors, and publically available information about precursors generally used by the semiconductor industry for the creation of the thin metal oxide films that Harvard discovered were part of the accused product. In other words, Harvard pleads a series of detailed facts, gathered from the sources that it had available to it, that all lead to the plausible inference that Micron uses the required precursor.

More specifically, Harvard identifies that “problems can occur with the use of ALD for the fabrication of small sized semiconductors.” (Compl. at ¶ 12). For example, “problems can occur in forming dielectric materials in deep trench structures, such as those found in dynamic random access memory (‘DRAM’) devices.” (Compl. at ¶ 12). A chemical precursor with appropriate reactive properties must be used to avoid these problems. (Compl. at ¶ 12). Micron manufactures small-size DRAM chips and is continually manufacturing smaller and smaller DRAM chips using ALD processes and materials claimed by the patents at issue. (Compl. at ¶¶ 14, 15).

Harvard cites to publicly available documentation identifying that Micron manufactures small-sized DRAM chips using ALD to produce dielectric films. (*See, e.g.*, Compl. at ¶¶ 29-36, 46-56). Harvard included “teardown” images of Micron’s actual products, which reveal that zirconium oxide is the dielectric film produced by Micron’s use of ALD. (*See, e.g.*, Compl. at ¶¶ 29-36, 46-56). Harvard then cites publically available documents that identify the required precursor as one of the most popular precursors used in industrial manufacturing for producing zirconium oxide layers such as the one in Micron’s DRAM chip. (*See, e.g.*, Compl. at ¶¶ 29-36,

46-56). Further, Harvard cites publically available information identifying that precursors within the class of chemistries more broadly claimed in the patent are the most commonly used for the manufacture of DRAM chips. (Compl. at ¶¶ 35, 53, 60, 62).¹ It is on this set of facts, taken together, that Harvard bases its allegation, on information and belief, that Micron manufactures its DRAM chips using the required precursor and, accordingly, meets these elements of the asserted claims of the patents at-issue. (Compl. at ¶¶ 32-36, 46-54, 55-56, 60, 62).

Thus, Micron's suggestion that Harvard's allegations are based solely on what is "popular" or what is "common" ignores the totality of the well-pleaded facts in Harvard's Complaint. Micron states, for example, that "[t]he most that can be inferred from Harvard's complaint is that some semiconductor manufacturers use an allegedly infringing compound as a precursor to forming metal oxide films." (Motion at 2). As set forth above, this is simply not true: Harvard's allegations are specifically directed at Micron, a semiconductor manufacturer, and its infringing manufacture of the accused Micron DRAM chips.

Micron also makes much of Harvard's reliance on publically available information regarding common industry use of the required class of chemistries and the required precursor for the manufacture of DRAM chips. (Motion at 2-3). Micron uses the terms "popular" and "common" frequently throughout its brief without specifically citing to any portion of the Complaint. Notably, however, the only mention of "popular" or "common" in the Complaint is Harvard's factual pleadings that the required precursor is one the most popular precursors used by DRAM manufacturers such as Micron, that these manufacturers use ALD to manufacture a zirconium dioxide dielectric layer (the dielectric layer found in Micron's accused DRAM chips),

¹ Due to a typographical error, paragraph 35 of the Complaint should read: "In DRAM applications '[a]lkylamides are the most commonly used precursors... for ZrO_2 ' ALD films." (See Compl. at ¶¶ 53, 60, 62 (emphasis added)). Alkylamides are the most commonly used precursors for the formation of both HfO_2 and ZrO_2 ALD films in DRAM applications.

and that precursors within the accused class of chemistries are the most commonly used for the manufacture of DRAM. (*See, e.g.*, Compl. at ¶¶ 35, 53, 60, 62).² These same paragraphs are the last step of the detailed series of facts which lead to Harvard's plausibly inferred allegation that Micron's secret method of manufacturing its DRAM chips meets each element of the exemplary asserted claims. Micron cannot choose to read only one paragraph of Harvard's Complaint in a vacuum, and declare it "insufficient."

B. Harvard's Claims Are Facially Plausible; Absolute Certainty Is Not The Standard.

Micron next argues that Harvard's allegations fail because it does not allege "that the claimed alkylamides are the *only* precursors that can be used to form the claimed metal oxide films." (Motion at 7). Micron then cites to a series of "public documents" outside the face of the pleadings and making no reference to Micron, from which Micron concludes (with no support or other explanation) that chemicals other than those within the required class of chemistries are capable of producing zirconium oxide film. As a preliminary matter, Micron's reliance on "publicly available" documents is an improper basis for its Rule 12(b)(6) challenge for two reasons. First, Micron asks this Court to consider evidentiary materials not alleged or incorporated in the Complaint, and of which Micron has not requested and this Court has no reason to take judicial notice. *Rodi*, 389 F.3d at 12; *Blake*, 898 F. Supp. 2d at 377. Second, in ruling on a Rule 12(b)(6) motion, a court generally accepts well-pleaded facts as true, and construes the complaint in the light most favorable to the plaintiff. *Langadinos*, 199 F. 3d at 69.

² Micron provides a nonsensical argument regarding the term "popular" as used to describe Twitter. Motion at 3-4. As a preliminary matter, Micron apparently asks this Court to consider documents that are not only outside the scope of the Complaint but that are outside the scope of anything remotely relevant to this case. Among other things, Micron makes no connection between Twitter, a social networking site accessible to anyone with an internet connection, and Micron's place in the market of DRAM manufacturers, manufacturing small-sized DRAM chips, using ALD, to produce a zirconium oxide dielectric layer.

That Micron may have reason to dispute a fact that Harvard has alleged in its Complaint is *not* an appropriate basis for seeking dismissal of that Complaint under Rule 12(b)(6).

Regardless, absolute certainty is simply *not* the proper pleading standard. This is particularly true in cases such as this, where Micron maintains the secrecy of the precise details of its manufacturing process. *See, e.g., Angiuoni v. Town of Billerica*, 2012 U.S. Dist. LEXIS 129058, *19-20 (D. Mass July 16, 2012) (allegations made on “information and belief” are permitted as long as there is a good faith basis for doing so, “particularly when the facts are the kind that are peculiarly within the possession and control of the defendant [] or where the belief is based on factual information that makes the inference of culpability plausible”).

Here, Harvard has conducted an extensive investigation and has pleaded that Micron uses the required precursor upon information and belief. Micron’s manufacturing process, including the exact precursor used during the ALD process, is confidential. Additionally, an inspection of Micron’s publicly available DRAM chips will not determine, with complete certainty, the exact chemical precursor used during ALD because the complete chemical precursor does not remain in the final product. That is because the precursor is used in a reaction that produces the dielectric metal oxide layer, the composition of which Harvard determined and pleaded in the Complaint.

Simply put, Micron cannot shield itself from a complaint alleging infringement by on the one hand operating in secrecy, and on the other hand demanding that a non-existent standard of absolute certainty be used when evaluating the sufficiency of infringement allegations. *See K-Tech*, 714 F. 3d at 1285-87. As set forth above, Harvard has met the actual pleading standard by pleading facts sufficient to allow this Court to draw a reasonable inference that Micron is using a

precursor from the required class of chemistries during the manufacture of the accused DRAM products.

C. The Cases Upon Which Micron Relies Are All Distinguishable From The Issue Present Here.

Finally, Micron cites to no relevant case law supporting its contention that Harvard's pleadings are insufficient. Micron cites three cases involving patent complaints after the abrogation of Rule 84 in December. None support the positions Micron has taken in its Motion.

Micron relies on two cases to support the legal standard: *Robern, Inc. v. Glasscrafters, Inc.*, 2016 LEXIS 95590 (D.N.J. July 22, 2016), and *RainDance Techs., Inc. v. 10X Genomics, Inc.*, 2016 LEXIS 33875 (D. Del. March 4, 2016). A review of the facts of these cases reveals that while in both cases the patent-owner's complaints were dismissed, the allegations in those complaints were nowhere near as detailed as the allegations in the instant matter. In *Robern*, the court found that plaintiff merely "echoed the statutory language and the requirements of the now-abrogated Form 18. This is not sufficient to meet the pleading standard." *Robern*, 2016 U.S. Dist. LEXIS 965590, *15. The plaintiff in *RainDance* failed to tie elements of the asserted claims to the defendant's products. *RainDance*, 2016 U.S. Dist. LEXIS 33875, *4-7. Neither of these failures could be asserted as to Harvard's allegations.

Micron relies most heavily on *Nu-You Tech., LLC v. Beauty Town Int'l Inc.*, Civil Action No. 3:15-cv-03433 (N.D. Tex. July 7, 2016). Leaving aside that *Nu-You Tech.* is non-precedential, it is also inapposite to the facts in this case. In *Nu-You Tech.*, the alleged patent claims were directed at a method which required the use of both a styling device and a styling liquid. *Id.* at 4. The plaintiff included counts for both direct and indirect infringement. For its claim of direct infringement, the plaintiff alleged, upon information and belief, that the defendant used the styling device and styling liquid during demonstrations at trade shows. *Id.* The

plaintiff's belief was based on the fact that two third party retailers provided "almost verbatim" instructions advising customers to use the styling device with the styling liquid. *Id.* The Court found that the plaintiff's allegations might support an inference that the defendant provided instructions (potentially relevant to a claim for indirect infringement), but that they did not support the further inference that the defendant used every step required by the asserted method claims at the trade show. *Id.* at 5. A claim for direct infringement requires sufficient direction or control by the alleged infringer where it is another party that actually performs the patented method. *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 797 F.3d 1020, 1022-1023 (Fed. Cir. 2015). Thus, the court in *Nu-You Tech* dismissed plaintiff's count for direct infringement, but permitted its claims for indirect infringement under 271(b) and (c) to continue as they were pleaded. *See, generally, Nu-You Tech., LLC*, Civil Action No. 3:15-cv-03433.

In this case, Harvard's direct infringement claims do not rise and fall over issues of direction or control, and Micron is not manufacturing DRAM chips in public demonstrations at trade shows. The production of DRAM chips requires the use of specific processing steps. While Micron keeps the precise details of its manufacturing process confidential, it cannot use ALD to produce a DRAM chip with a zirconium oxide dielectric layer without using a chemical precursor. The specific chemical precursor used by Micron is kept confidential. However, publicly available information cited by Harvard provides the direct inference that Micron uses the required precursor or a precursor within the required class of chemistries to manufacture its small-sized DRAM chips, using ALD, to form a zirconium oxide dielectric layer. All of these facts are alleged in Harvard's Complaint.

In other words, Harvard's well-pleaded Complaint has tied each element of the exemplary claims of the asserted patents to Micron's accused DRAM chips, it has explicitly

alleged that Micron's manufacturing process meets each of the elements of the exemplary claims of the asserted patents, and, to the extent that certain facts about Micron's manufacturing process remain secret, Harvard has relied on circumstantial evidence to reach a reasonable inference that Micron's manufacturing process infringes those elements of the asserted claims. The cases cited by Micron do not change the nature of these well-pleaded facts, or alter the fact that they state a claim for relief that is plausible on its face.

IV. CONCLUSION

Harvard pleaded sufficient factual allegation to support its claim that Micron's confidential process for manufacturing DRAM chips uses the required precursor. Based on the foregoing reasons, Harvard respectfully requests that this Court deny Micron's Motion to Dismiss in its entirety.

Dated: August 29, 2016

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that on this day, the 29th day of August, 2016, I electronically filed the foregoing with the Clerk of the Court by using the CM/ECF system, which will send a Notice of Electronic Filing (NEF) to the following:

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